QUARTERLY SUMMARY

OF THE

IMPROVEMENTS AND DISCOVERIES

IN THE

MEDICAL SCIENCES.

ANATOMY AND PHYSIOLOGY.

1. *Blood Corpuscles of the Human Embryo.*—Mr. PAGET has examined the blood of a fœtus of four weeks old, which is the earliest period at which it has been submitted to microscopic inquiry. The great majority of the red corpuscles presented a circular outline, and as they rolled over appeared spheroidal and vesicular. Their surfaces were smooth, and as they dried, portions of their edges were incurved and folded towards their centres. They were apparently more deep-coloured than in adult blood. The nuclei were circular, with well-defined dark outlines, and darkly nebulous, as if granulated. All the corpuscles were nucleated; some contained two nuclei, and were ovoidal, and larger than the rest.

The measurements of the spheroidal corpuscles were from 1-2100 to 1-2800th of an inch in diameter; that of the nuclei from 1-3700 to 1-4500th. Of the bi-nucleated cells the measurements were 1-1500 by 1-2300th of an inch.—*London Medical Gazette,* Feb. 1849.

2. *On the Changes which take place in the Lungs after Division of the Pneumogastric Nerves.* By Dr. SCHIFF.—It is well known that, after section of the vagus nerves in the neck of an animal, death frequently takes place at an interval of a few days. In these cases the lungs are found to have undergone alterations, characterized by congestion, and the effusion of a large quantity of frothy sanguinolent serum into the bronchi; which lesions have been ascribed by authors to the paralysis of the glottis consequent on the section of its nerve (the recurrent), which induces respiratory obstruction, either directly, or by permitting of the passage of food and other matters into the trachea. Dr. Schiff has performed a variety of experiments which disprove these ideas. By cutting in some animals the recurrents, and in others the pulmonary branches of the vagus, he has convinced himself that the section of the latter causes congestion, with tumefaction of the bronchial mucous membrane; while that of the former only produces narrowing and paralysis of the glottis, without any pulmonary changes. The lesions of the lungs are, likewise, unaffected by the performance of tracheotomy, and by the section of the œsophagus in the neck (in dogs). He, therefore, concludes, that the state of the lungs is dependent on the integrity of the pulmonary portion only of the nerve. Section of the nerve on one side produced a slighter amount of pulmonary lesion, but never confined to the lung of one side; a circumstance which M. Schiff accounts for by considering the anastomoses in the pulmonary plexus of nerves.—*Archiv für Physiologische Heilkunde,* 1847; *Gazette Médicale,* 2d Dec. 1848.

[Dr. J. Reid considers the congestion and bronchial effusion as a secondary effect of the diminished frequency of respiration in animals in which the vagi are divided.—(*Ed. Med. and Surg. Journal,* April 1839.) This idea agrees perfectly with the results of the above experiments; and is, we doubt not, quite correct.]—*Monthly Retrospect,* Jan. 1849.

3. *On the Mechanism by which the Valves of the Heart are closed, and by which the Sounds of the Heart are produced.* By Dr. Joseph Hamernik of Prague.—In this paper, the author recapitulates at some length the opinions of Dr. Baumgarten on the mechanism by which the valves are closed, which he considers of much importance, and with which he professes his concurrence.

The most important points in Dr. Baumgarten's views, are, that during the systole of the auricles, there is either no regurgitation, or of a very trifling amount, from the auricles into the great venous trunks. This, he conceives, is prevented by a circular arrangement of muscular fibres, observed by anatomists to surround the orifices of the veins; by the blood being impelled in the direction of the auriculo-ventricular orifice, in consequence of the greater portion of the muscular fibres of the auricle being inserted into the tendinous border of these openings; and by the *vis à tergo* of the blood; and in the right side, by the valve at the mouth of the vena cava. This latter, however, Dr. Hamernik considers to be inoperative in the adult, and only useful in the fœtus. He attaches great importance to the force of the current of blood flowing in the venous trunks, due to the alternate pressure exercised by the respiratory movements, reflux being prevented during expiration by the valves in the veins at the base of the neck; and in the vena cava inferior, he attributes a valvular action to the displacement of the liver during expiration, which diminishes the calibre of the vein at its passage through the diaphragm. Dr. Baumgarten considers the pulsatory movements observed in the healthy state of parts in the great veins, to depend on the sudden interruption of the current of blood during the auricular systole.

That the auriculo-ventricular valves are closed by the counter pressure of the ventricular blood, suddenly developed by the contraction of the *auricles.* That the cavities of the auricles and ventricles, during the heart's diastole, are distended by the continuous current from the veins; while at this period the valves are to be found floating in the blood in the form of a funnel. That the object of the auricular systole is to induce such an amount of tension in the contents of the ventricles, and of course in the blood surrounding the funnel-shaped arrangement of the valves, as to cause their rapid closure; and that in this way only can regurgitation be prevented. If the heart be removed from the body, and the auricles cut away (it is better, however, to operate with one only), the artery obstructed by ligature, or by filling it with wax, and the cavity of the ventricle filled with a saline solution, the valve is found lying in the position above described. If then a stream of water be directed upon the valve from the height of a foot, so as to imitate the sudden contraction of the auricle, the valve is seen to close with great rapidity. If, however, an attempt be made to imitate the ventricular systole, by squeezing the ventricle with the hand, a large portion of its contents regurgitates before closure is effected.

That the closure is not due to the operation of the musculi papillares, but that it is much facilitated by the small specific gravity of the valves, which enables them to float on the surface of the blood.

Dr. Hamernik then proceeds to make some remarks, which he considers in part deducible from the preceding.

1. It is possible that there may occur one or more systoles of the ventricles, unpreceded by any auricular action, forming what is called the "rhythmus intercurrens" of the heart's action. In chronic asthma and pneumonia, the blood, powerfully propelled by the expiratory movements, may distend the auricles to such an extent, that they are unable to contract on their contents. In which circumstances, two or more systoles of the ventricles are required before the auricles can unload themselves.

2. The division by the older anatomists of the ventricles into portio auricularis, and portio arteriosa, is physiologically and pathologically significant. In the former, there is a current of blood until the closing of the auriculo-ventricular valves, continuous with that of the veins. In the latter, a current is esta-